

Dr. LeConte communicated two more lists :

1. List of Coleoptera found in the Lake Superior region, by H. G. Hubbard and E. A. Schwarz.
2. Contribution to a list of the Coleoptera of the Lower Peninsula of Michigan, by the same.

Dr. Horn communicated two papers :

1. Synopsis of the *Colydiidae* of the U. S.
2. Revision of the species of the sub-family *Bostrichidae* of the U. S.

Prof. Frazer threw upon a screen, by means of Mr. Holman's calcium light with microscope, magnified reflections of the pits in tin foil produced by the stylus of a phonograph, and showed by a discussion of their shapes that different vowels and vowels of different time lengths had different and constant characteristic marks visible to the eye, that these marks were single, double and triple, always connected in the same manner and order. Even the resolution of diphthongs appeared possible. His experiments were made with the assistance of Mr. Plush of Philadelphia, and on his phonograph.

Prof. Frazer also recorded a new use of the "Edison transmitter" for measuring amounts of pressure by means of the galvanometer.

Pending nominations, Nos. 852 to 856 were read, and on motion the regular election of members was postponed to the next meeting.

And the meeting was adjourned.

Stated Meeting, May 3d, 1878.

Present 13 members.

Vice-President, MR. FRALEY, in the chair.

Photographs for the Album were received from Prof. F. A. March, of Easton, Pa; Prof. T. M. Drown, of Easton, Pa; Prof. W. C. Cattell, President of Lafayette College, Easton, Pa.; Prof. Thomas Conrad Porter, of Easton, Pa.; and President F. A. P. Barnard, of Columbia College, New York City, with a letter from the same.

A letter of acknowledgment was received from the Royal Academy of Sciences in Lisbon, dated March 12, 1878 (96, 98).

A letter was received from the Count de Toronas, dated Madrid, April 16th, 1878, announcing the transmission of a donation for the Library, as a mark of friendly sympathy with the objects of the Society.

Donations for the Library were received from the Society at Ulm; *Revue Politique*; Commercial Geographical Society at Bordeaux; *Flora Batava*; Astronomical and Antiquarian Societies of London; Editors of *Financial Reform Almanac* and *Nature*; Boston Natural History Society; *Museum of Comparative Zoology*; Editors of *Plumber and Sanitary Engineer*, New York; Mr. W. E. Dubois of Philadelphia; Dr. Henry Hartshorne; U. S. Geographical and Geological Survey of the Territories, and *Ministerio de Fomento*, Mexico.

The following communication was made by the Secretary, "A detailed section of the rocks included between the lower productive coal measures and the dark shales of the Devonian, in the vicinity of Renova, Clinton Co., Pa., by H. M. Chance, of the Geological Survey of Pennsylvania."

The Secretary read portions of a letter from Mr. W. D. H. Mason, Williamstown, Pa., describing the circumstances of his recent discovery of reptilian footprints on a slab of slate rock from the shaft of the Ellengowan Colliery, overlying the mammoth anthracite coal bed, in the Mahanoy Valley, Schuylkill Co., Pa., the original being in the possession of Mr. Lorenz of the Reading R. R., to be deposited in the museum of the Academy of Natural Sciences.

Letter of Mr. Wm. D. H. Mason, C. E., of Williamstown, Dauphin County, Pennsylvania, on the Batrachian Foot-tracks from the Ellengowan Shaft in Schuylkill County, Dated April 5, 1878.

As an additional link added to knowledge in the mystery attending the process of creation going on during the coal formation, in which geologists have heretofore been almost unanimous in doubting the existence of higher animal life, the finding of the singularly clear fossil Batrachian foot-marks imprinted on the gray slaty sandstone overlying the mammoth seam of

coal, which have for some time past been exhibited in the office of W. Lorenz, Esq., Chief Engineer of the Philadelphia and Reading Railroad Company, were placed in his care for critical examination by those interested in such discoveries, previous to being presented by Mr. Lorenz, on my behalf, to the Academy of Natural Sciences at Philadelphia.

These foot-marks might easily be mistaken by people in general for those made by a small bird, on account of the three toes on the front and one at the back part of the foot with the joints and curved nails or claws, which are distinctly shown by their deeper indentations on the stone. The cushion-like ball of the foot aids the deception; but the regular alternation of front and hind, right and left feet, each on their own line, as made by four-footed animals of the kind, dispels the idea of a biped.

These foot-prints were found on the 15th of June, 1876, at Ellangowan colliery, owned and operated by the Philadelphia and Reading Coal and Iron Company, situated in E. Mahanoy Township, Schuylkill Co., Pa., about midway between Mahanoy City and Shenandoah, in a small valley diverging from the Mahanoy valley proper. In this valley a split of the mammoth seam occurs which can best be explained by the mining engineers of the C. & I. Co., who have access to the maps and mines with all their secrets, splittings and ramifications, together with all the peculiarities, depth and thickness of rock and coal seams at that point.

Inquiry, at the time, of the bosses of the colliery, elicited the bare information that the rocks amongst which the specimen was found, had been taken from the shaft while it was being sunk and overlaid the mammoth; but they could give nothing definite as to depth below the surface, or position. My own impression is, that it was taken from the upper and most shelly or shale-like portion of this stratum of slate; this opinion being based upon the fact that the most noticeable peculiarities exist mainly in its upper portion. Of these peculiarities, the frequent occurrence of nodules of hematitic iron and occasional ripple marks are the most prominent. In fact, it was by the observation of these characteristics that I was led to search among the rocks lying around, that the footmarks were found, and, if not destroyed by the burning of the breaker last fall, the other portions of the same rock still remain there. The piece bearing the marks was much larger than it now is and was trimmed down for convenience in carriage, though the foot-marks were all preserved and all I cared for.

It had been lying under the eaves of a shed, subjected to the dripping of water therefrom for several years, and close to the path leading around the shed, and by which path the mules were driven when used at the breaker. Only a portion of one foot was first visible, but by carefully removing thin films or scales of slate, the others were brought out. So cautiously did I work, that the impressions on the upper scales were destroyed, because too thin, and the danger of injuring those on the body of the stone. The fear of injury was so strong, that I only felt sure of my prize when it was safely deposited in my room at the hotel. Habitual search for fossils when about a rock bank of a coal mine, or where slates and shales present any in-

dication of fossil remains, led me to search around on the occasion of this find which solves so knotty a problem.

The frequent occurrence of nodules of iron in different rocks, shales, or argillaceous deposits, I have never seen ascribed by any writer I have had access to, to any cause other than the accidental collection of ferruginous matter by molecular attraction; but in the center of such nodules, some definite shape is often found; sometimes a leaf, an insect or only a grain of sand; or, the interior cavity may be filled with ocherous or argillaceous matter.

In the old red sandstone, fossilized fish and plants most frequently show a casing or thin cover of a strongly ferruginous nature, which decreases in strength with increased distance from the center of the cast in the same ratio as one color is blended into another by the artist.

In the slates and fine sandstones where nodules appear, they either have a cavity of loose, ocherous matter—a pyritous speck or a mass of small, strongly sulphurous pyrites in crystals—sometimes only a grain of sand; and in the coarser sandstones between the coal seams, the plants exposed on their surface present a dark brown appearance, which shows a red streak when the film is thick enough to bear scratching.

Balls found in the slates and fine sandstones vary in shape as they do in size, from a perfect sphere, to irregular oblongs of every imaginable form.

Now, taking the abundance of fossil fish and other organic remains found in some portions of the old red sandstone, may we not reasonably suppose that the gray, slaty sandstone, overlying the mammoth coal seam, lying low down in our anthracite coal measure, has, in like manner been a receptacle for the remains of animal life; although these remains present to the eye more of the appearance and form of potatoes than animal remains? Is it not possible that by partial decomposition and chemical action upon their tissues and bones, they were converted into a pulpy or gelatinous substance which, by the action of the water in which they were floated or by the joint attrition of water and fine mud into which their bodies were borne, these jelly-like remains were rolled out of all semblance to their original organic shape, and then, by the strange chemistry of the period, became each a nucleus to which were attracted the minute particles of iron converting their remains into the substances and shapes they now bear?

These thoughts suggested themselves at various times before the finding of the tracks in the same bed by the singularly animal-like shape of some of the nodules previously met with. “Accidental” shapes they may have been, as I could find no trace of tooth, claw, or bone of any kind, yet this does not discourage me from holding to the firm belief, amounting almost to conviction, that such discoveries will be made, and by the calling of attention to this point by men of acknowledged scientific character, others may be led to examine more closely these singularly sown nodules and yet more conclusively than these few tracks, establish beyond dispute the existence of animal life in abundance during the period of the formation of coal.

The tunnel driven through Big Lick Mountain, at the Summit Branch Colliery at this place (Williamstown), furnished me at one time with a specimen of more interest, if possible, than the saurian foot-marks from the Mahanoy Valley, being no less than a sandstone cast of the head of the thigh bone of some animal that had evidently been of large size, the cast having been over four inches in diameter, and nearly ten pounds in weight. It was presented to me by Mr. Daniel James, the foreman of the gangs of men driving the tunnel from the south side. He could not find a trace of the other portion, as it had been thrown out by a blast, although he searched carefully. In appearance the cast had a striking similarity to the head of the femur in a human skeleton and was almost perfect, owing to its great hardness and the hard character of the surrounding rock, some of which clung to it most tenaciously and could not safely be removed by hammer and chisel. Unfortunately it went astray by getting into the hands of some unprincipled individual during transmission to the Society of Natural Sciences at Reading, to which my design was to present it, and only the memory remains.

This most interesting cast was from a "slip," in excessively hard rock lying north of what is here known as the "Whites" vein or seam of coal, hundreds of feet beneath the mammoth, but overlying the Lykens Valley seam. As I preserved no record or drawing of this find, it is only by a draft upon memory to give an indistinct idea of it in a rude drawing as this * * * *

The cast was a fine-grained, very compact sandstone, wholly different in texture and color from the surrounding rock of the "slip," which was over a hundred feet beneath the surface of the mountain and several hundred yards from the southern opening of the tunnel, so that, without an opening to the surface, which there was not, it could not reasonably be suspected to have been the remains of an animal dropped in from the surface. This was in the summer of 1872, but the impression it then created was very strong and its appearance still remains vivid in memory.

Respectfully, &c.,

WM. D. H. MASON.

WILLIAMSTOWN, DAUPHIN CO., April 4, 1878.

Prof. Prime exhibited photograph pictures of limestone (*Siluro-cambrian*) outcrops along the west bank of the Lehigh River above Allentown, which evidently verify Prof. Rogers' hypothesis of the cause of the general south-east dips which prevail through the Great Valley. In these pictures a number of local sharp overthrown anticlinal rolls or saddles are beautifully exhibited.

Prof. Frazer remarked that he had just completed his Susquehanna river section in Lancaster County, through

the same limestone formation, and was surprised to find evidence in its construction, of very broad and regular anticlinals with opposite dips: the whole limestone series measuring more than 3000 feet; a measurement corresponding very well with that of the limestones in York Co.

Prof. Prime said that he could not obtain more than 2000 feet of limestones in the Lehigh region.

Prof. Houston described some improvements which he and Prof. Thomson had been making in the form of the telephone.

Pending nominations Nos. 852 to 856 were read and balloted for, and No. 857, and new nominations Nos. 858 to 863 were read.

On motion of Dr. LeConte, the consideration of Prof. Cope's resolution was again postponed, on account of his absence.

The ballot boxes being scrutinized by the presiding officer, the following persons were declared to be duly elected members of the Society:

852. C. Newlin Peirce, D.D.S., Philadelphia.

853. Rob't H. Alison, M. D., of Philadelphia.

854. Wm. D. Marks, Prof. Mech. Eng., Univ., Pa.

855. Lewis M. Haupt, Prof. Civ. Eng., Univ., Pa.

856. Burt G. Wilder, Prof. Anatomy and Zoology, Cornell University at Ithaca, N. Y.

And the meeting was adjourned.

Stated Meeting, May 17th, 1878.

Present, 17 members.

Vice-President, MR. FRALEY, in the chair.

Dr. Wormly, Prof. Marks and Dr. Alison, newly-elected members, were introduced to the presiding officer and took their seats.

Letters accepting membership were received from Mr. An-